

TECHNICAL NOTES

THE SURVEY UNIVERSE

The data collected in the fall 1996 Survey of Graduate Students and Postdoctorates in Science and Engineering represent national estimates of graduate enrollment and postdoctoral employment at the beginning of academic year 1996–97 in all academic institutions in the United States that granted doctorate or master’s degrees in any science or engineering field. Included are data for all branch campuses, affiliated research centers, and separately organized components such as medical or dental schools, schools of nursing, public health, etc. The survey universe consisted of 722 reporting units at 603 graduate institutions. Included were 255 master’s-granting institutions and 467 reporting units associated with 348 doctorate-granting institutions.

The National Science Foundation (NSF) has collected data on graduate science and engineering (S&E) enrollment and postdoctoral appointees since 1966. From fall 1966 through fall 1971, data from a limited number of doctorate-granting institutions were collected through the NSF’s Graduate Traineeship Program, which requested data only on those S&E fields supported by NSF. Beginning with the fall 1972 survey, this data collection effort was assigned to the Universities and Nonprofit Institutions Studies Group and was gradually expanded during the period 1972–75 to include additional S&E fields as well as all institutions known to have programs leading to the master’s or doctorate degree. Because of this expansion, data for 1974 and earlier years are not strictly comparable with 1975 and later data. Technical Table 1 shows the number of institutions, reporting units, and departments at each level included in the data, as well as the total enrollment reported for each year between 1966 and 1996. No attempt has been made to inflate the data for 1966–74 to reflect universe totals.

Beginning with the 1984–85 academic year, master’s-granting institutions were surveyed on a sample basis. The fall 1988 survey included the entire survey population for the first time since 1983–84. For each year since 1988, any institutions that begin S&E master’s or doctoral programs are added to the survey universe and any that close all their S&E graduate programs are deleted. (See Survey Methodology, below.)

Technical Tables 2 and 3 present data on departmental coverage by S&E field for doctorate-granting and master’s-granting institutions for the last 8 years surveyed.

THE SURVEY INSTRUMENTS

The Survey Questionnaire on which data were reported in fall 1996 was the first to include a request for information on students who receive the majority of their support from the National Aeronautics and Space Administration.

Each survey package also included the following items:

1. an enclosure detailing mailing package contents;
2. a flyer explaining NSF’s academic S&E surveys;
3. cover letter to survey coordinators at graduate schools or at medical schools;
4. cover letter to departmental respondents;
5. a computer-generated List of Departments or Programs (NSF Form 811) specific to each institution surveyed and based on the departments known to exist in the previous survey cycle;
6. a “crosswalk” showing National Center for Education Statistics (NCES) instructional program codes corresponding to each S&E field as defined by NSF;
7. a “How To Avoid Common Survey Errors” sheet with guidelines for avoiding the most common mistakes made in the graduate student survey; and
8. a postcard acknowledging receipt of the survey and requesting the respondent to indicate changes in coordinator name, address, telephone number, or e-mail address.

SURVEY METHODOLOGY

The survey packages were mailed out by November 30, 1996. The final survey universe consisted of 722 reporting units at 603 institutions.

The acknowledgment postcard requested that institutional coordinators indicate how the data were collected, whether the data were maintained centrally or collected from individual departments, and whether they were derived from a computerized database or were hand tabulated. Of the 722 reporting units surveyed, 98 percent have provided this information over the past 8 years.

The use of a combination of sources is reported by the majority of the schools as being the most used source of data. The use of computerized systems is on a small

but gradual increase, while the number of schools reporting the use of hand tabulating is on a slow decrease. This suggests a shift in the source from which data are derived.

Institutional coordinators were asked to review the departmental listing provided on the Survey Questionnaire, to indicate any changes in their departmental structure such as departments newly formed, phased out, split, or merged, and to check off any departments that had neither graduate students nor postdoctorates and for which Survey Questionnaires would therefore not be submitted. The revised Form 811s were returned to the data processing contractor for use as a checklist in tracking departmental responses.

A Survey Questionnaire was completed for each department either centrally or at the departmental level and was returned to the data processing contractor for data entry, editing, and tabulation. Arithmetic errors, inconsistencies between items, and sharp year-to-year fluctuations were referred to the institutional coordinators for correction or clarification.

THE RESPONSE RATE

Of the 723 reporting units included in the fall 1996 survey, 715, or 98.9 percent, were able to provide at least partial data, distributed as follows:

At the departmental level 11,377 departments responded, or 98.1 percent of the 11,592 departments surveyed. This includes 9,896 departments providing complete responses, or 85.2 percent of the total. A total of 216 departments, or 1.9 percent of the departmental total, required complete imputation, and 1,519 or 13.1 percent, had one or more data cells imputed. Technical Table 4 presents the department response rates for earlier years for comparison.

Missing data for partially nonrespondent departments were imputed using the departments' previous year's data, where available, or data from peer institutions in cases where data had not been reported the previous year. Data for nonrespondent departments (departments that did not provide any data) were imputed using data from the previous year, where available. The number of departments in doctorate-granting and master's-granting institutions that required total or partial imputation and the numbers and proportions of full-time and part-time graduate students and postdoctorates imputed are shown in Technical Tables 5 and 6. Imputation rates by survey data item are provided in Technical Table 7.

CHANGES IN DATA ITEMS

Although NSF has attempted to maintain consistent trend data, some modifications in the survey questionnaire have been made to respond to changing issues over the past 20 years. As a result some data items are not available for all institutions in all years.

Major changes in the data collected are as follows:

- From 1975 through 1977, data for master's-granting institutions were collected on a short form (i.e., an abbreviated form of the survey) that did not collect data on sex or citizenship of graduate students, nor any data on postdoctoral appointees. In 1978 a similar questionnaire was sent to doctorate-granting institutions, but master's-granting institutions were not surveyed. In addition, the 1978 questionnaire did not collect data on mechanisms of support for full-time students. All mechanisms of support data for that year were combined on one line and appeared as "other types of support" in any data tables. The 1978 figures shown in the tables for master's-granting institutions represent estimates based on 1977 and 1979 data. Beginning in 1979 the long form (i.e., the full-scale survey form) was sent to both doctorate-granting and master's-granting institutions.
- Distribution by sex was originally requested only for full-time graduate students at doctorate-granting institutions. Beginning in 1976 master's-granting institutions were requested to provide data on all graduate students by sex, and in 1977 similar data were requested for all graduate students in all institutions. The short form used in the 1978 survey did not request any information on sex; figures in the tables represent estimates based on 1977 and 1979 data.
- Citizenship data were collected only for graduate students enrolled full-time in doctorate-granting institutions through 1977. No citizenship data were requested on the short form used for master's-granting institutions in 1975-77 and for doctorate-granting institutions in 1978. Data on citizenship of all full-time graduate students are available beginning in 1979 and on those enrolled part-time since 1983.
- Racial/ethnic data were first requested in 1979 and became a standard item on the questionnaire in 1980.

- “Fellowships and traineeships” were combined on one line until 1979, when separate data on the two mechanisms were first collected.
- “Other nonfaculty research staff with doctorates” were combined with postdoctoral appointees until 1979.
- Separate data on students receiving their primary support from the U.S. Department of Agriculture were first requested in 1985.
- Racial/ethnic data by sex were first requested in 1993 and became a standard item on the questionnaire in 1994.
- Separate data on students receiving their primary support from the National Aeronautics and Space Administration were first requested in 1996.

DATA REVISIONS

During the fall 1988 survey cycle, the criteria for including departments in the survey universe were tightened, and all departments surveyed were reviewed. Those departments not primarily oriented toward granting research degrees were no longer considered to meet the definition of science and engineering. As a result of this review, it was determined that a number of departments, primarily in the field of “Social sciences, n.e.c.”

(not elsewhere classified), were engaged in training primarily teachers, practitioners, administrators, or managers rather than researchers; these departments were deleted from the database. This process was continued during the fall 1989–96 survey cycles and expanded to ensure trend consistency for the entire 1975–96 period. As a result, total enrollments and social science enrollments for all years were reduced. The net effect of adjustments over the years is shown in Technical Table 8.

During the same period, the survey methodology changed so that the institution’s highest science and engineering degree in the current year would apply to all previous years in which that institution was surveyed. Since a number of master’s-granting institutions have become doctorate-granting institutions, the combined effect has been a smaller decrease in enrollment at doctorate-granting institutions than at master’s granting institutions. For the years 1975–76 and 1991–92, there was an increase in enrollment at doctorate-granting institutions after subsequent-year modifications.

The definition of “medical schools” was revised during the fall 1992 survey cycle to include only those institutional components that are members of the Association of American Medical Colleges. Tables generated after the fall 1992 survey differ from their counterparts in earlier years in that they exclude schools of nursing, public health, dentistry, veterinary medicine, and other health-related disciplines, and should not be compared with tables from earlier years.